

UNITED STATES BANKRUPTCY COURT  
SOUTHERN DISTRICT OF NEW YORK

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In re

TRONOX INCORPORATED, *et al.*,

Reorganized Debtors.

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TRONOX INCORPORATED,  
TRONOX WORLDWIDE LLC  
f/k/a Kerr-McGee Chemical Worldwide LLC,  
and TRONOX LLC f/k/a Kerr-McGee  
Chemical LLC,

Plaintiffs,

v.

KERR-MCGEE CORPORATION, *et al.*,

Defendants.

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THE UNITED STATES OF AMERICA,

Plaintiff-Intervenor,

v.

TRONOX, INC.,  
TRONOX WORLDWIDE LLC,  
TRONOX LLC,  
KERR-MCGEE CORPORATION, and  
ANADARKO PETROLEUM  
CORPORATION,

Defendants.

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)  
) Chapter 11

) Case No. 09-10156 (ALG)

) Jointly Administered

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) Adversary Proceeding No. 09-01198 (ALG)

**DIRECT TESTIMONY OF STEPHEN B. ETSITTY**

I, Stephen B. Etsitty, testify as follows:

1. I am the Executive Director of the Navajo Nation Environmental Protection Agency (“Navajo EPA”). My testimony addresses certain facts and issues that I understand to be in dispute in this case, including (i) the nature of the environmental harm from former uranium mining sites on the Navajo Nation; (ii) the Navajo Nation’s policy that all hazardous substances must be removed from Navajo territory; and (iii) the fact that prior efforts to address surface physical hazards at certain abandoned mines did not reduce the need for a true environmental clean-up at those sites.

**Personal Background**

2. The Navajo Nation lies within the States of Arizona, New Mexico and Utah, and covers an area larger than West Virginia. (A map of the Navajo Nation, showing locations of abandoned uranium mines, is shown at PX1046, fig. 1-5.<sup>1</sup>) More than 250,000 people are members of the Navajo Nation.
3. I grew up on the Navajo Nation near the Lukachukai Mountains in Arizona. I attended Stanford University and graduated with a bachelor’s degree in 1991. After graduation, I worked for five years for the U.S. Environmental Protection Agency (“U.S. EPA”) Region 9 Indian Programs Office in California. Before returning to the Navajo Nation, I also worked for three years as national manager for the U.S. EPA’s Office of Solid Waste Tribal Programs in Washington, D.C.
4. On July 22, 2003, I became Executive Director of the Navajo EPA. As Executive Director, I supervise, approve, and monitor all uranium-related remediation activities, as well as other activities related to environmental clean-up, hazardous waste regulation, and solid waste and groundwater remediation, occurring on the Navajo Nation. I am also a member and past Chair of U.S. EPA’s National Tribal Caucus, which is designed to improve communication and build stronger partnerships between U.S. EPA and tribes.
5. In October 2007, I testified before the U.S. Congress House Committee on Oversight and Government Reform regarding the legacy of uranium mining and milling on the Navajo Nation. Since then, I have met with representatives of Committee Chairman Henry Waxman and other federal officials, and continued to meet with representatives from private companies that mined and processed uranium on our land, to ensure that our land and our people are restored to *hozho*, the state of harmony essential to Navajo culture.

**The Legacy of Uranium Mining on the Navajo Nation**

6. The Navajo Nation sits atop vast uranium deposits. Navajo teachings from long ago warned us to leave it alone. But we opened our borders to allow companies like Kerr-McGee to mine uranium to support the U.S. nuclear weapons program. Kerr-McGee and other companies

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<sup>1</sup> PX1046, at TRX-ENVTL1706920.



mined large quantities of uranium on the Navajo Nation, which they sold to the federal government.

7. These mining companies were supposed to return the land to us in the same condition in which they found it when they arrived. From my work at Navajo EPA, I am familiar with the standard form leases that were used for uranium mining on the Navajo Nation during the 1950s and 1960s. These leases – which Kerr-McGee Oil Industries, Inc., signed – required the return of our land “in as good condition as received, except for the ordinary wear and tear and unavoidable accidents in their proper use of the premises....”<sup>2</sup> That did not happen. Instead, the mining companies left large piles of mining waste containing radioactive materials next to numerous abandoned mines.
8. The legacy of uranium mining blankets the Navajo Nation. Numerous areas of the Navajo Nation, including those where Kerr-McGee mined, have suffered and continue to suffer health and environmental impacts from uranium mining. Most of the mines operated by Kerr-McGee were in my home area of the Lukachukai Mountains, Arizona, as well as Church Rock, New Mexico.
9. Radioactive mining waste is found throughout the Navajo Nation, and has contaminated our land and water. The Lukachukai Mountains, where contamination from mining by Kerr-McGee and others is widespread, are used by the Navajo for many purposes. Navajos use these areas as traditional summer sheep camps, which allow our people and their livestock to find cooler temperatures during the summer. Because trees grow more readily in the Lukachukai Mountains than in other areas on the Navajo Nation, Navajos (including my relatives) go into these mountains to collect timber that is used for building across the Navajo Nation. The area is used for hunting, as well. Additionally, many plants and herbs grow in the Lukachukai Mountains that Navajos collect and use for ceremonial purposes, in traditional medicine, and to dye wool used for weaving. Certain traditional ceremonies take place in the Lukachukai Mountains; my grandfather on my mother’s side was a medicine man who would spend time in the Lukachukai Mountains for traditional and other purposes. While it is sometimes hard for non-Navajos to understand, these traditions remain part of our very existence. But as we exercise these important traditions, Navajos are being exposed to radioactive waste rock.
10. This radioactive waste has also contaminated our water – both surface waters and groundwater. Because 30 percent of Navajo residents lack access to the public water supply, Navajos often haul drinking water from unregulated sources that can contain uranium and other contaminants. Navajo EPA and U.S. EPA have tested more than 240 unregulated water sources and have found more than 29 wells above uranium standards as of October 2011. Navajo children swim in contaminated water. Additionally, livestock, on which many Navajo depend for their livelihood, drink contaminated water and have been born deformed or diseased.

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<sup>2</sup> GPX0001.033 at 001641, 001154, 001146, 001601 (four leases from 1961 between Navajo Nation and Kerr-McGee); PX0079 at TRX-ENVTL1296849, 853-54 (assignment of 1949 lease to Kerr-McGee); PX0030 at 001532, 001519-20, 001523 (assignment of 1949 lease to Kerr-McGee).

11. Exposure to contamination extends beyond the area of the mines themselves. Radioactive mine waste and other contaminated soils travel by wind or wash down arroyos during rainstorms or when snow melts in the spring.
12. The Navajo Nation is an agrarian society. We eat what we raise on the land. The radioactive waste permeating our land has made this a dangerous practice.
13. Even our roads have been contaminated. A public highway, which runs near the former Kerr-McGee Quivera mine, was contaminated with radioactive materials spilling from mining trucks. A Geiger counter held while driving that highway would click and scream, confirming a radioactive public transportation corridor.
14. Not understanding the harmful health effects of uranium, Navajos have used radioactive waste rock as building materials in their homes. Navajo EPA and U.S. EPA have demolished 34 structures and excavated 12 residential yards because they were built with or contained radioactive materials. U.S. EPA has rebuilt more than a dozen replacement homes.
15. To demonstrate the extent of radioactive contamination resulting from uranium mining, when I testified before Congress I brought with me a small sample of soil that a Navajo EPA consultant had obtained near Tuba City, Arizona. The sample contained radiation measuring 15 to 30 times the background level of radiation. Shipping restrictions, concerns by the U.S. Capitol police, and safety issues prevented us from bringing a sample with even higher levels of radioactivity that unfortunately can be found in numerous areas across the Navajo Nation. During my testimony, I waved a device that we use to detect gamma radiation toward the sample. Even before I opened it, the device was beeping. It began beeping rapidly when I uncovered the sample. The sample was quickly sealed and removed from the hearing room.
16. The levels I picked up on that particular sample were high, but did not put anyone in the room at immediate risk given the limited period of exposure. But some Navajo families have lived for years within a few hundred yards of materials like the sample that we are told we should not be exposed to for more than an hour. This kind of exposure, which has resulted from Kerr-McGee mines as well as others, presents a grave public health concern.
17. Even after all of the waste finally has been safely disposed of outside Navajo borders, public health issues will remain. Potential health effects from abandoned uranium mines include lung cancer and other respiratory issues from inhalation of radioactive particles as well as bone cancer and impaired kidney function from exposure to radionuclides in drinking water. I have walked across many of these sites, come to know the families, felt their anger, and heard their stories of unexplained cancers, kidney failures, birth defects and sores that do not heal. The legacy of uranium mining and milling has, and will continue to impact, generations of Navajos.



### The Navajo EPA

18. The Navajo EPA was established in 1994 to protect our unique relationship with our land, including by addressing uranium contamination on the Navajo Nation.<sup>3</sup> The enabling legislation recognized the significance of this relationship:

The Navajo culture promotes and values respect for the knowledge of the harmonious, balanced and sacred interdependence of all aspects of life on the Earth. In the Navajo Way, the Earth is our mother, the mountains part of her sacred body, the watercourses her veins and arteries. When the Earth is injured, the resultant instability, imbalance and disharmony bring illness to life on Earth, including humankind. Harmony and balance are restored through a recognition of the conditions that led to disharmony and through actions to reaffirm and restore harmony and balance. Thus, the integrity and health of the Navajo environment are intimately related to the health and well-being of present and future generations of Navajo people.<sup>4</sup>

19. Since then, the Navajo EPA has worked hard to develop laws and regulations to address uranium and other contamination on the Navajo Nation. In 2000, we obtained U.S. EPA's authority to implement the public water systems supervision program of the federal Safe Drinking Water Act, and in 2004, we were delegated authority to implement the federal Clean Air Act Title V permitting program for twelve sources within the Navajo Nation.
20. We also worked with the Navajo Council to enact seven environmental laws in the mid-1990s, including the Navajo Nation Clean Air Act and the Navajo Nation Clean Water Act. Navajo EPA implements and enforces these laws. In 2000, we began work on a Navajo Nation Comprehensive Environmental Response, Compensation and Liability Act ("Navajo CERCLA"), which was enacted in March 2008. Navajo CERCLA reduces our reliance on the U.S. government by providing us with authority similar to that enjoyed by federal and state governments to address hazardous waste.
21. Recently, the Navajo Nation enacted the Radioactive Materials Transportation Act of 2012, which reiterates the Navajo Nation's commitment to governmental action to address the harms caused by uranium mining and related activities, and authorizes the Navajo EPA to restrict transportation of radioactive materials within the Navajo Nation.<sup>5</sup> In May 2012, our President signed an Executive Order establishing a Uranium Task Force in anticipation of a Uranium Commission, which will assist with the significant task of helping to establish cleanup priorities for the un-remediated uranium contaminated sites located throughout

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<sup>3</sup> PX114.

<sup>4</sup> PX113 ¶ 4.

<sup>5</sup> PX1313.

Navajo Indian Country.<sup>6</sup> These two recent actions, taken by the legislative and executive branches of the Navajo government, show how our nation struggles on a daily basis to deal with the disaster left from irresponsible operators of former uranium mines and mills.

22. We have also worked to develop the expertise necessary to remediate uranium sites on our own, rather than to rely on U.S. EPA to lead the work. Last fall, we completed the first uranium remediation project where Navajo EPA was the lead agency. We excavated approximately 5,600 cubic yards of radioactive material from the Highway 160 site and transported it off the Navajo Nation to a disposal site in Grand Junction, Colorado. The project was completed on time and under budget.

**Navajo Policy Prohibiting Disposal of Hazardous Substances on Navajo Nation**

23. It is the policy of the Navajo Nation that hazardous substances, including uranium waste, must be removed from the Navajo Nation and disposed of outside the territorial boundaries of the Navajo Nation. This policy has been in force and effect since before I became Executive Director of the Navajo EPA.
24. In addition to addressing risks to human health and the environment that I have discussed, the policy is designed to reduce the impact of uranium mining waste on significant customs and cultural values that are unique to the Navajo people. To appreciate why we are opposed to any permanent disposal of hazardous substances on the Navajo Nation, it is important to understand the concept of Diné Bik' eyah. Diné means "the people." Bik' eyah means "the land." When these words are put together, it means that the land and the people are inextricably bound. They cannot be separated. The life of the land is bound with the life of the people. The concept is philosophical, spiritual, religious and sacred for the Navajo. When the land is denigrated, the people are denigrated. It is critical culturally that contaminated Navajo lands be restored to their pre-contamination condition.
25. The concept of Diné Bik' eyah and other Navajo concepts of fundamental law have been codified in the Navajo Nation Code. The Code provides that the "four sacred elements of life, air, light/fire, water and earth/pollen, in all their forms must be respected, honored and protected for they sustain life." 1 N.N.C. § 205(A). The earth cannot be respected, honored and protected if hazardous substances, brought to the surface and concentrated by mining companies, are allowed to remain on Navajo lands.
26. The policy against disposal of hazardous substances on Navajo Nation was articulated publicly in writing at least as far back as October 29, 2002, when the Navajo EPA issued a memorandum disallowing landfarms for petroleum-contaminated soils on the Navajo Nation.<sup>7</sup> Landfarming is a remediation technique that involves spreading excavated contaminated soils in a thin layer on the ground and stimulating biodegradation. The Navajo EPA memorandum stated: "Be advised that the Navajo Nation will not allow any landfarms

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<sup>6</sup> PX1314.

<sup>7</sup> PX1256, Ex. A.



in Navajo Nation. Therefore, all petroleum-contaminated soil must be removed from the Navajo Nation to a state permitted landfarm.”<sup>8</sup>

27. In November 2003, I hand-carried and delivered a letter to U.S. Department of Energy officials in Washington, DC, requesting “clean closure (excavation and removal of all waste and transport and dispose the waste at a permitted disposal facility)” of mixed wastes, which the Navajo Nation believes include radioactive uranium waste, from a site in Tuba City, AZ.<sup>9</sup>
28. In April 2007, when U.S. EPA removed radioactive soil from residences and yards located between a Kerr-McGee mine and another abandoned mine, the Navajo Nation pressed for the waste to be disposed of outside of the Navajo Nation. The U.S. EPA accordingly shipped this soil for disposal at a facility in Grandview, Idaho.
29. On July 19, 2009, then-President of the Navajo Nation, Joe Shirley, reaffirmed the policy that hazardous substances must be removed from the Navajo Nation during his speech to remember the 30th anniversary of the Church Rock uranium disaster.<sup>10</sup>
30. Consistent with the policy, in 2011, Navajo EPA transported the radioactive waste excavated from the Highway 160 site, referenced in paragraph 22, above, off the Navajo Nation to a disposal site in Grand Junction, Colorado.
31. Currently, U.S. EPA, the Navajo EPA, and United Nuclear Corporation are remediating the Northeast Church Rock uranium mine. High-level radioactive waste, referred to as “principal threat waste,” from the Northeast Church Rock mine site will be transported to a disposal facility distant from the Navajo Nation, while the remainder of the waste will be disposed of outside of the Navajo Nation in a repository at the existing UNC Mill Superfund Site near Gallup, New Mexico.

#### **The Navajo Ban on Uranium Mining**

32. The Navajo Nation has banned further uranium mining and processing in its territory until such time as the contamination left behind by companies such as Kerr-McGee is cleaned up.
33. In April 2005, the Navajo Nation enacted the Diné Natural Resources Protection Act of 2005.<sup>11</sup> The Navajo Nation issued a public press release on April 30, 2005 announcing the passage of the law.<sup>12</sup> The law states:

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<sup>8</sup> PX1256, Ex. A.

<sup>9</sup> PX1304, at 1.

<sup>10</sup> PX1256, Ex. B at 2.

<sup>11</sup> PX0531.

<sup>12</sup> PX0544.

The purpose of the Diné Natural Resources Protection Act of 2005 is to ensure that no further damage to the culture, society, and economy of the Navajo Nation occurs because of uranium mining within the Navajo Nation and the Navajo Indian Country ... until all adverse economic, environmental and human health effects from past uranium mining and processing have been eliminated or substantially reduced to the satisfaction of the Navajo Nation Council.<sup>13</sup>

34. Since the passage of the Diné Natural Resources Protection Act of 2005, there has been economic pressure to reopen Navajo lands to uranium mining. The unemployment rate in the Navajo Nation exceeds 50 percent, and there has been renewed interest in uranium as prices increased significantly from the early to mid-2000s. Despite these pressures, mining and milling uranium remains illegal because the adverse economic, environmental and human health effects from past mining and processing remain.

**Limitations on the Navajo Abandoned Mined Lands Reclamation Program**

35. It is my understanding that Defendants' expert reduces his cost estimate for the Kerr-McGee mines because of work performed under the Navajo Abandoned Mined Lands Reclamation Program ("AML"). Based on my work for Navajo EPA, I am familiar with the work performed under the AML and believe that Defendants' expert misunderstands the program.
36. The AML was a Navajo program that, using very limited resources, attempted to reclaim certain abandoned uranium mines in the Navajo Nation. The reclamation work performed through the AML was focused on addressing surface physical site hazards, and principally involved activities such as sealing mine shafts, closing mine openings and stabilizing waste piles. AML did not attempt a true clean-up of these sites, which would include a full investigation and remediation of contaminated soil and water and bringing the site back to productive use.
37. AML was funded under the Surface Mining Control & Reclamation Act ("SMCRA"), which provides limited funds primarily to address the impacts of abandoned coal mines, with an emphasis on physical hazards such as open portals and shafts. After the priority coal mines on the Navajo Nation had been addressed, the AML was allowed to use SMCRA funds for reclamation work at the abandoned uranium mines. As with coal mine reclamation under SMCRA, the priority in reclamation at the abandoned uranium mines is physical hazards rather than environmental damage. The limitations of the work performed by AML are described in some detail in the 1993 testimony before Congress regarding uranium mining waste in the Navajo Nation.<sup>14</sup>

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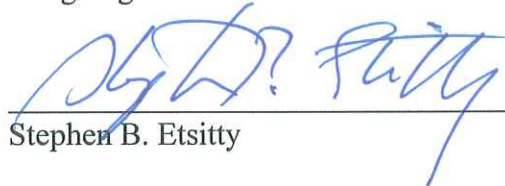
<sup>13</sup> PX0531, § 2.

<sup>14</sup> PX110, at 18, 19-20, and 31-32.



38. Even with respect to the work performed by AML, I have seen examples where the prior reclamation work is failing because of erosion, other natural weatherization processes, and subsidence. This has once again exposed the contaminants that were covered up in the past.
39. The limited nature of the work performed under the AML can be seen at the Skyline Mine on the Navajo Nation in Monument Valley, Utah. Even though AML performed a reclamation at the site in the 1990s, the U.S. EPA, with assistance from the Navajo EPA, has recently spent over \$7 million to conduct an interim CERCLA removal action to address waste at the site.
40. The Skyline remediation also shows the challenges in remediating abandoned uranium mines. The U.S. EPA prepared a presentation that includes pictures of its work at the Skyline Mine.<sup>15</sup> The pictures in PX1282 accurately reflect site conditions and the work that was performed at the site. Similar to many of the former Kerr-McGee mines, the Skyline Mine sits on top of a mesa as shown on page 5. The logistical challenges of remediating sites such as these include the construction of access roads (which is shown on pages 11 and 12) and the removal of waste rock and contaminated soil from the steep sides and slopes of mesas (pages 18 and 19). These challenges also greatly increase the costs.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

  
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Stephen B. Etsitty

Executed this 30th day of May, 2012, in New York, NY

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<sup>15</sup> PX1282.